

CLAIMS

1. A microwave oscillator of very high stability,
5 characterized in that it comprises a one-piece
dielectric resonator (1, 7, 10) in the form of a right
cylinder frustum hollowed out at mid-height along
chords of its cross section, so as to leave a central
core and two lateral flanges, the drillholes having
10 symmetry of order N, where $N \geq 4$, at least the plane
faces of the cylinder being covered with a
superconducting material (5-6, 8a-8b, 11a-11b), the
resonator being placed in a cryogenic chamber (32) and
being connected to an amplifier via optimized
15 couplings, and the tuning of the resonator being done
by a magnetic field and a phase loop.

2. The oscillator as claimed in claim 1,
characterized in that the resonator is placed in a
20 triple chamber comprising a first chamber (30) for
vacuum insulation, a second chamber (31) filled with a
gas that can liquefy or solidify at the operating
temperature of the resonator, and a third chamber (32)
filled with a gas that remains gaseous at said
25 operating temperature.

3. The oscillator as claimed in claim 1 or 2,
characterized in that the amplifier (23) is placed in
the same cryogenic chamber as the resonator.

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4. The oscillator as claimed in one of the preceding
claims, characterized in that, when the cavity has two
coupling ports (25, 26) for connecting it to the
amplifier, the signal is output at a third coupling
35 port (28) of the cavity.

5. The oscillator as claimed in one of the preceding claims, characterized in that the resonator is made of single-crystal sapphire.